

BATRACHIANS AND REPTILES FROM BRITISH EAST AFRICA.

BY SETH EUGENE MEEK.

The batrachians and reptiles listed in this paper were collected in 1905-7 by the Museum's East African expedition in charge of Mr. C. E. Akeley, assisted by Mr. Edmund Heller. This expedition was engaged chiefly in collecting mammals and birds, and so the collection of batrachians and reptiles is not large when compared with the great amount of material obtained belonging to these two groups. The new species of mammals have been described by Mr. W. H. Osgood,* who has in preparation a full account of the entire collection. An annotated list of the birds collected by this expedition was prepared by Dr. N. Dearborn† and published by the Museum.

I wish to express my thanks and obligations to Dr. G. A. Boulenger for his kindness and generosity in identifying most of the species. The British Museum contains a large collection of East African reptiles, and these Dr. Boulenger knows better than does any other person.

Batrachians.

Rana mascariensis Günther.

Nairobi. 38 mm., color dark with marbling on hinder part of thighs; 38 mm., same as above but much lighter color on back.

Athi River. 35 mm., uniform grayish, no definite marblings.

Lake Elmenteita. 54 mm., light band on back, thighs marbled.

Phrynobatrachus natalensis (A. Smith).

Nairobi. 21 mm.; Lukenya, 23 mm. The specimen from Lukenya differs from the one from Nairobi in having a much smoother skin, and in the presence of a white dorsal stripe.

Arthroleptis minutus Boulenger.

Nairobi. One specimen, 19 mm.

* Field Mus. Nat. Hist. Pub. 141 and 143. Zool. Ser., Vol. X. Nos. 2 and 3, pp. 5-22.

† Field Mus. Nat. Hist. Pub. 135. Ornith. Ser., Vol. I., No. 4, pp. 141-190.

Rappia marmorata (Rapp).

The specimens of this species vary greatly in color. The general color varies from light gray, the body being covered with small black dots, to a dark uniform brown with the black dots inconspicuous.

Athi Plains: Two specimens, 20 and 28 mm., ♂ dark gray, body with small black dots; 25 mm., ♂, dark gray, body with small black dots; 24 mm., ♂, light gray, with inconspicuous dark dots; 26 mm., ♂, brownish gray with dark dots; 25 mm., ♀, light gray, dark dots not conspicuous; 26 mm., ♀, light gray with very small black dots.

Lukenya. 27 mm., ♀, gray, black dots present; two specimens, 23 and 16 mm., ♀, uniform with fine black dots; 29 mm., ♂, very dark uniform brown.

Rappia cinctiventris (Cope).

Athi Plains. Two specimens, 27 and 22 mm., ♂.

Lukenya. Two specimens, 27 and 22 mm., ♂.

Kijabe. One specimen, 22 mm., ♂.

Cassina senegalensis (Dumeril & Bibron).

Athi Plains. 37 mm., ♂, dark median dorsal stripe present, lateral broken into elongate blotches.

Nairobi. 32 mm., ♀, color same as the preceding; 29 mm., ♀, dorsal band broken into two blotches, each one shaped like a figure eight.

Hylambates bocagei (Günther).

Lukenya. One specimen, 37 mm.

Phrynomantis bifasciata (A. Smith).

Lukenya. One specimen, 31 mm., lateral white bands present, also the large heart-shaped white spot on coccygeal region; legs with white spots.

Hemisus marmorata (Peters).

Lukenya Hills. One specimen, 29 mm.

Bufo regularis Reuss.

Athi Plains. One specimen, 12 mm.

Molo. One specimen, 90 mm.

Lake Elmenteita. One specimen, 59 mm.

Reptilia.

Trimerorhinus tritæniatus (Günther).

Naivasha. Body 225 mm., tail 55 mm., scales 17-186-68.

Lukenya. Body 545 mm., tail 149 mm., scales 17-185-61.

Athi River Camp. Body 490 mm., tail 107 mm., scales 17-173-57, 4th and 5th labials enter the eye.

Stripes as described by Dr. Boulenger are very distinct on this specimen, much more so than on the specimens mentioned above.

Molo. Body 151 mm., tail 32 mm., scales 17-174-56; body 151 mm., tail 36 mm., scales 17-169-63.

The lines so distinct on the larger specimen from Athi River Camp are very faint on these two small specimens.

Rhamphiophis oxyrhynchus (Reinh.).

Voi. Body 615 mm., tail 282 mm., scales 17-171-116, 23 scales on neck.

Psammophis sibilans (Linnæus).

Voi. Body 589; scales 17-157-? A portion of the tail is missing. The color of this specimen is same as described in var. D. by Dr. Boulenger, Cat. Lizards, iii, 163.

Elapechis guentheri (Bocage).

Kijabe. One specimen in poor condition. Length of body 175 mm., tail 20 mm., scales 13-158-32.

Causus resimus (Peters).

Nairobi. Body 609 mm., tail 17 mm., scales 17-161-25.

Vipera hindii Boulenger.

Aberdare Mts. Body 249 mm., tail 31 mm.; scales 27-134-31; body 190 mm., tail 25 mm., scales 27-144-34. Subcaudals in 2 rows; scales all keeled.

Bitis arietans (Merr.).

Nairobi. Body 780 mm., tail 59 mm., scales 35-138-21.

Lycophidium capense (Smith).

Nairobi. One specimen in poor condition. Length of body 250 mm., tail 40 mm., scales 17-200-82.

Chlorophis neglectus (Peters).

All of the specimens of this species in the collection are very much alike in color and appearance.

Voi. Body 525, tail 204, scales 15-170-85.

Athi River. Body 484, tail incomplete, scales 15-171-?; body 520, tail incomplete, scales 15-178-?, body 435, tail 242, scales 13-156-120. Kijabe. Body 540, tail 241, scales 15-175-106; body 518, tail 243, scales 15-171-110; body 369, tail 190, scales 15-164-121.

Kenya Province. Body 342, tail 143, scales 15-157-92.

Coronella semiornata Peters.

Voi. One small specimen.

Kijabe. Body 406 mm., tail 127 mm., scales 21-195-83; body 147 mm., tail 54 mm., scales 21-189-90.

In all the specimens the subcaudals and anal are divided. The larger specimen is dark olive brown, without lines or spots; ventrals dark with light edges; preorbital and postorbital not light colored. Small specimen from Kijabe with the middle of each scale black on anterior part of body; ventrals light, their ends darker, edges light colored.

Leptodira hotambœia Laur.

Athi River. Body 479 mm., tail 80 mm., scales 19-170-48, no white cross bars.

Lake Elmenteita. Body 591 mm., tail 84 mm., scales 19-179-44, anterior part of body with cross bars made up of small white spots.

Mt. Kenya. Body 372 mm., tail 33 mm., scales 17-179-24 (?). The tail blunt, apparently once broken, no white cross bars.

Hemidactylus brookii Gray.

One specimen taken on the steamer in the Red Sea, body 43 mm., tail 40 mm.

Hemidactylus mabouia (Moreau).

Voi. Three specimens, body 70 mm., tail 63 mm.; body 71 mm., tail missing; body 68 mm., tail 71 mm.

Lygodactylus picturatus (Peters).

Voi. Body 34 mm., tail 31 mm., ♂; body 34 mm., tail 35 mm., ♂; body 35 mm., tail 42 mm., ♂; two females with tail imperfect are 37 mm. and 34 mm. respectively.

Agama colonorum Daud.

Voi. Nine females, 45 mm. to 100 mm., and eight males, 50 mm. to 100 mm.

Lukenya. Eleven females, 75 mm. to 100 mm., and seventeen males, 90 mm. to 120 mm.

Kenya Province. Two females, 45 mm.

The tail of the males is more spinose and of greater diameter than that of the females, the keels on the upper row of scales are largest and form a low keel which, though present, is less prominent in the males. In some of the larger males the abdomen is dark, the portion about the groin and the under surface of the head is nearly uniform brick-red. In most specimens of both sexes the under surface is light colored, except the chin, which is striped or marbled with darker; the tails are banded on some specimens to nearly uniform color on others.

Agama caudospinosa sp. nov.

Type No. 2312, F.M.N.H.; length, body 91 mm., +tail 128 mm. = 219 mm.; Lake Elmenteita, B.E.A.

Head depressed; nostril tubular, directed slightly upward and backward, pierced in posterior part of small nasal, the opening just below the canthus rostralis; upper head scales smooth; a narrow elongate scale on the middle of the snout; occipital not enlarged; ten upper labials; sides of the head near the ear and neck with groups of small spines, the longest less than half the diameter of the ear openings; ear opening larger than the eye; throat plicate, no gular pouch; body depressed, the back not keeled; dorsal scales imbricate, with weak keels slightly converging towards the vertebral line; dorsal scales smaller than the caudals but larger than on sides and ventral surface; ventral scales without keels; 45 scales between the origin of the arms to the origin of the legs; no distinct nuchal crest; a few nuchal scales with slightly enlarged keels, no trace of dorsal keel, 70 to 85 scales around middle of body; the fourth finger slightly longer than the third, tip of the fifth extending beyond the first; fourth toe a little longer than the third, the 5th extending beyond the first; tail long, covered with large strongly keeled spinose scales, forming distinct annuli; male with a row of anal pores; tail not keeled above.

Color dark brownish, with light cross lines or light blotches on rump and tail; under surface of males light to dark brown; under surface of head with the light and dark in slightly irregular longitudinal bands.

This species differs from *A. colonorum* in the absence of a nuchal

Locality	Locality				
	Gilgil	Gilgil	Gilgil	Lake Elmenteita	
Length of body.....	106	108	114	91	77
Length of head.....	30	30	33	27	23
Width of head.....	25	25	25	20	18
Tip of snout to ear.....	24	24	26	21	18
Interorbital.....	15	14.5	15	12	10
Length of arm.....	51	50	51	45	36
Distance from base of 5th finger to tip of 4th.....	14	14	15	14	11
Length of leg.....	70	74	73	64	57
Length of tibia.....	29	30	29	24	22
Distance from base of 5th toe to tip of 4th	22	24	24	22	18
Length of tail.....	106*	122*	120*	128	106
Scales around body.....	51	54	52	52	55

crest, slightly larger, more faintly keeled and less convergent dorsal scales, and the very large and strongly spinose scales on the tail. The nostril is slightly lower and less directed upward. The bands on under surface of the head are much more conspicuous than on any of the specimens of *A. colonorum* in the collection.

All of the specimens are males. The above measurements are given in mm.

Agama atricollis A. Smith.

Nairobi. Body 80 mm., tail 92 mm., ♀; body 103 mm., tail 110 mm., ♂.

Kijabe. Body 35 mm., tail broken.

Gil Gil. Body 77 mm., ♀; body 88 mm., tail 103 mm., ♂; body 113 mm., tail 118 mm., ♂.

Lake Elmenteita. Body 75 mm., tail 76 mm., ♀; body 100 mm., tail 111 mm., ♀; body 87 mm., tail 101 mm., ♂; body 99 mm., tail 122 mm., ♂; body 115 mm., tail 147 mm., ♂; body 88 mm., tail 103 mm., ♂; body 113 mm., tail 118 mm., ♂.

The specimens mentioned above show some variation, the female from Nairobi and a female (100 mm.) and a male (87 mm.) from Elmenteita have 5 whitish blotches on dorsal surface about the size of the eye, and a few narrow faint whitish lines across the back between these blotches; the tail is distinctly barred with black. On the female from Gilgil these spots and lines are very indistinct. The ventral surface of the head is light to dark brown irregularly spotted with lighter, to bluish black on the old males. The ground color of the

*The tails of the three specimens from Gilgil are apparently incomplete, the ends being quite blunt but are scaled over; the diameters of these ends are 6, 3 and 5 mm. respectively.

upper surface is grayish to nearly uniform brown; the fingers and toes are barred.

The position of the nostril varies a little; in most specimens it is slightly below the canthus rostralis. Males have 2 or 3 rows of anal pores.

Varanus niloticus (Linnæus).

Kisumu. One specimen. Body 100 mm., tail 140 mm.

Eremias spekii Günther.

Voi. Six specimens of about uniform size, the two perfect specimens measure as follows: Body 48 mm., tail 85 mm.; body 47 mm., tail 78 mm.

Gerrhosaurus flavigularis Weigman.

Nairobi. Body 140 mm., head 26 mm., width of head 18 mm., arm 37 mm., leg 60 mm., tail 225 mm. (tail not perfect, and with a bud or branch 5 mm. in length 35 mm. from its tip), scales 8-20-56, femoral pores 12; body 122 mm., head 24 mm., width of head 18 mm., arm 37 mm., leg 60 mm., tail 292 mm., scales 8-22-58, femoral pores 14 and 15; body 145 mm., head 32 mm., width of head 23 mm., arm 36 mm., leg 69 mm., tail 310 mm., scales 8-22-57, femoral pores 16.

The squamation of the head of these three specimens is the same. Fronto-nasals not touching rostral; prefrontals forming a suture about equal in length to fronto-nasal; frontal nearly twice as long as broad and as long as its distance to rostral; fronto-parietals forming a suture; interparietal very small; parietals forming a suture behind interparietal twice the length of this scale.

Brownish above, a light narrow median and a broader light black-edged line on each side extending from nostril and upper margin of eye, fading out near middle of length of tail; sides with narrow bars composed of light and dark spots; belly light; upper surface of head marbled with darker. In point of scales these specimens more nearly agree with *G. nigrolineatus* as described by Dr. Boulenger, which is regarded as a synonym of *G. flavigularis* by Tornier.

Gerrhosaurus major Dumeril.

Voi. One specimen. Body 88 mm., head 22 mm., width of head 19 mm., arm 29 mm., leg 40 mm., tail 119 mm., scales 32 in transverse series, 12 longitudinal series, ventrals in 10 series, 13 femoral pores. Scales on top of head slightly rugose; fronto-nasal broader

than long, scarcely in contact with the rostral; prefrontals in contact, forming a suture about $\frac{2}{3}$ length of fronto-nasal; fronto-nasal divided on its posterior $\frac{2}{3}$ by a groove in line with prefrontal suture; width of frontal 1.6 in its length, its length greater than its distance from the tip of snout; parietals forming a suture behind parietal; fronto-parietal suture equals length of prefrontal suture; a single narrow shield in front of ear opening.

Color uniform brown above, yellowish beneath.

Mabuia brevicollis (Wiegman).

Voi. Two specimens. Body 120 mm., tail 175 mm.; body 127 mm., tail missing.

Color brown, the edges of the scales are darker, forming dark lines along the rows of scales. A few white spots on lower portion of sides of the neck; ventral surface of head and region about the groin dark blue, the rest yellowish; 32 scales around the middle of the body; fingers and toes overlap when the limbs are appressed.

Lukenya. Two specimens. Body 121 mm., tail missing; body 100 mm., tail 122 mm.

In both of these specimens the lines along the rows of scales are well defined. Narrow dark bands on sides extending across back; in these are many white spots. On the larger specimen are 4 bands between ear and arm, 8 between arm and leg; ventral surface light, the throat black spotted, a few scattered spots on sides of belly. The smaller specimen resembles the larger except the bars across back are less prominent; these bands extend on tail. The general color of these two specimens much resembles that of *Chalcides ocellatus*.

Athi River. One specimen. Body 128 mm., tail 150 mm.

Color much lighter than the preceding, the stripes along the rows of scales evident but not conspicuous; ventral surface light, the throat bluish; no distinct white spots nor dark bars anywhere; toes and fingers scarcely meet when the limbs are appressed.

Mabuia quinquetæniata (Licht.).

Voi. All of the specimens of this species in the collection were taken at this place. Six of the specimens have the median dorsal and the two lateral bands well developed, the body with very few or no white spots or dots. These specimens measure as follows: Body 37 mm., tail broken; body 51 mm., tail 76 mm.; body 59 mm., tail broken; body 57 mm., tail broken; body 88 mm., tail 95 mm.; body 85 mm., tail broken. Three specimens have faint light dorsal

and lateral bands, and the body with numerous small bluish white spots. Three white narrow vertical bars just back of the ear, between these a black blotch; ventral surface light, the throat bluish. These specimens are males and the six mentioned above are probably females.

Mabuia striata (Peters).

Nairobi. Color brown above, a broad dorso-lateral band on four of the specimens; the color is uniform on the other. Body 84 mm., tail 120 mm., the color is darker, mottled with dark brown and white spots. The toes of the appressed leg reaches to or nearly to the elbow. The measurements of the four specimens are: Body 61 mm., tail 68 mm.; body 86 mm., tail 112 mm.; body 86 mm., tail lost; body 78 mm., tail has been partly renewed. The ventral surface of two of these specimens is white, the other two are the same except the ventral surface of the head, which is spotted with brown.

Lukenya. Two specimens uniform brown above with two dorso-lateral bands; ventral surface white, one being faintly brown-spotted. Body 78 mm., tail 111 mm.; body 65 mm., tail 98 mm. The appressed hind limb nearly reaches elbow.

Lake Elmenteita. Three specimens, more or less spotted with brown spots and small white spots. Ventral surface bluish white, the under surface of head brown spotted. These specimens measure as follows: Body 70 mm., tail 85 mm.; body 80 mm., tail broken; body 82 mm., tail 120 mm. The appressed leg nearly reaches elbow.

Mabuia megalura (Peters).

Athi Plains. Body 50 mm., tail missing; body 20 mm., tail 38 mm., a light lateral band and 3 dark dorsal lines. Fingers and toes overlap about half their length when the limbs are appressed.

Lukenya. Body 35 mm., tail 83 mm., white lateral band prominent, the dark dorsal lines faint. Fingers and toes overlap nearly their entire lengths when the limbs are appressed.

Kijabe. Body 66 mm., tail 185 mm. Color light brownish, the dark dorsal lines very faint, white lateral band distinct. The tips of the fingers and toes scarcely touch when the limbs are appressed.

Mabuia varia (Peters).

Voi. Five specimens, apparently all females. All are light brownish with small dark brown spots, no light spots; ventral surface uniform white to a light tinge of brownish in the female with four young. The lower light lateral stripe well defined; the upper one

very faint to quite absent; median dorsal band absent. One individual, body 56 mm., tail 93 mm., contained 6 young. In these the lateral stripes are well defined, the median dorsal one very faint or absent. The young measured as follows: Body 19 mm., tail imperfect; body 20 mm., tail 27 mm.; body 20 mm., tail 28 mm.; body 21 mm., tail 27 mm.; body 22 mm., tail 25 mm.; body 23 mm., tail 25 mm.

A second female, body 55 mm., tail 68 mm., contained 4 young. The colors of these young are slightly paler than those mentioned above. These measured as follows: Body 15 mm., tail 20 mm.; body 15 mm., tail 25 mm.; body 17 mm., tail 21 mm.; body 19 mm., tail 23 mm. The three other specimens measured: Body 50 mm., tail 63 mm.; body 53 mm., tail 78 mm.; body 46 mm., tail missing.

Nairobi. Two specimens. The one, body 48 mm., tail 80 mm., is light brown with dark brown spots, no white spots, the lateral bands prominent, the median dorsal one very faint; the other, body 54 mm., tail 82 mm., is slightly darker and besides the dark spots there are some small white ones on the back. All of the stripes fairly well defined.

Lukenya. One specimen. Body 53 mm., tail, partly missing, light brownish, with the dark brown spots and many small white spots; lateral stripes prominent, median dorsal stripe not present.

Molo. These specimens are much darker and more uniformly colored than those mentioned above; the stripes though present are very faint. The ventral surface is brownish white. On throat and ventral surface the head is bluish which in 2 specimens (probably males) extends over most of the belly. They measure as follows: Body 50 mm., tail 40 mm. (not perfect); body 49 mm., tail 64 mm.; body 49 mm., tail 70 mm.; body 46 mm., tail 70 mm.; body 40 mm., tail missing.

***Lygosoma sundevallii* (A. Smith).**

Kijabe. One specimen. Body 75 mm., tail 55 mm.; each scale with a brown spot; ventral surface uniform yellowish.

***Ablepharus wahlbergii* (A. Smith).**

Voi. Body 41 mm., head 5.5 mm., width of head 4 mm., arm 6.5 mm., leg 10 mm., tail imperfect. Broad dark band on sides with yellow line above it, dorsal region dark brown.

Nairobi. Body 46 mm., head 6 mm., width of head 4.5 mm., arm 7 mm., leg 10 mm., tail 36 mm.; body 35 mm., tail missing, the specimen in poor condition. Color same as specimen from Voi.

Lukenya. Body 41 mm., tail 45 mm. Color same as in above specimen.

Chamæleon jacksoni Boulenger.

Lukenya Province. The collection contains 8 females and 7 males from this place. The males are easily distinguished by having the rostral and two occipital horns of about equal length. These cephalic projections on the female are short, the occipital ones are usually very short, in these specimens never more than half the length of the rostral horn, which is shown in the following measurements:

Sex	♀	♀	♀	♀	♀	♀	♀	♀	♂	♂	♂	♂		
Length of body in mm.	132	127	112	91	89	85	83	133	139	135	109	105	72	63
Length of rostral horn in mm.	12	15	5	9	4	12	8	15	27	25	19	17	8	9
Length of occipital horns in mm.	1	2.5	2.5	1	2	3	1	2	29	25	18	17	8	8

The three largest females contained no eggs or young, but in the remaining ones eggs were present. The eggs are spherical and are connected in a string resembling a string of beads. The diameter of the eggs in a female 91 mm. in diameter, which contained 18 eggs, is 8 mm. The eggs of this species are smaller than are those of *C. dilepis*, which are oval-shaped but which form a similar string along the line of the greater axis.

Chamæleon hoehneli Steindachner.

Voi. Three specimens, 84 mm., 73 mm., and 72 mm. The two smaller ones gravid, with the embryos each enclosed in a thin membranous sack; body of embryos 2 mm. in length.

Kijabe. Two specimens, 89 mm., and 87 mm.

Lukenya. Four specimens, 65 mm., 62 mm., 38 mm., 27 mm.

The largest specimen contained 7 eggs, each 8.5 mm. in diameter. Eggs nearly spherical and connected, appearing like a string of beads. In each egg the outline of the embryos was formed.

Mt. Kenya. Two specimens, 82 mm. and 73 mm.

Molo. Six specimens, 80 mm. to 90 mm. in length. These contained no eggs. Two other individuals, 66 mm. and 75 mm., contained eggs with quite well developed embryos. The larger individual contained 9 eggs, each of which was less than half absorbed by the embryo. The embryos in the smaller specimen were less developed. The eggs are nearly spherical, each about 9 mm. in diameter.

In addition to the above the collection contains from Molo 11 small (2 mm.) specimens, which appear to be embryos taken from a specimen not in the collection. From the above it appears that the breeding time of the four species mentioned is about March and April. The eggs are fully formed in December, and the young are born probably between March and June.

Chamæleon ellioti Günther.

Lukenya. Ten specimens, 40 mm. to 65 mm. One female, 63 mm., contained 13 embryos, each one being contained in a thin membranous sac; body of each embryo 20 mm. in length, the egg being fully absorbed.

Chamæleon dilepis Leach.

Voi. One specimen, female, body 122 mm., which contained several eggs. The eggs are oval, the long diameter of each is 15 mm., the short diameter 8 mm. The ventral surface was cut to allow the preservative to penetrate better and some of the eggs were probably lost. These eggs are very different in shape from the nearly spherical ones found in the preceding species.

Molo. One specimen, 106 mm.

Machakos. One specimen, 90 mm.

Kinixys belliana Gray.

Nairobi. One specimen. Length of carapace 160 mm., width (measured at hip) 104 mm., width (measured at shoulder) 97 mm.; greatest height (measured on rump) 59 mm., height (measured at shoulder) 57 mm., length of plastron 136, carapace being present.

Athi Plains. One specimen, measured like the above, is, length 93 mm., width 72 mm., width 69 mm., greatest height 39 mm., height 39 mm.; length of plastron 85, carapace being absent.

The color of these two specimens is practically the same, except the smaller is the brighter, and colors in more contrast. Carapace with margins of shields black, the centers yellow; plastron yellow, irregularly blotched with darker.

Pelomedusa galeata (Schoepff).

Lukenya Hills. One specimen. Length of carapace 93 mm., width (middle) 72 mm., height (middle) 29 mm., length of plastron 83 mm.

Color dark brown some mottled with darker, plastron yellowish with irregular dark markings, these mostly along sutures.